

## REMARKS

The Office Action mailed 28 April 2008, has been received and its contents carefully noted. The pending claims, claims 1-7 and 10-13, were rejected. By this response, claims 1-7 and 10-13 have been canceled and claims 14-24 have been added. Support may be found in the specification and the claims as originally filed. For example, see paragraph [0022], Figure 1 (embodiment 2), and Example 2 (embodiment 2) set forth in paragraphs [0041] to [0043] of the US publication of the instant application. No statutory new matter has been added. Therefore, reconsideration and entry of the claims, as amended, are respectfully requested.

### **Rejection under 35 U.S.C. 102(b)**

The Examiner rejected claims 1, 2 and 13 under 35 U.S.C. 102(b) as being anticipated by Acker (US 20020102451). Specifically, the Examiner asserted that Aker discloses the claimed invention.

Applicants respectfully submit that the present invention as claimed is directed to a process for manufacturing a membrane electrode unit (MEU) containing a “double layer anode”. As provided herein, independent claims 14 and 21, are directed to the process for making a double-layer anode. As claimed, the anode gas distributor and the membrane are coated directly with anode catalyst. Applicants respectfully submit that Acker does not teach or suggest directly coating the anode gas diffusion substrate and the ionomer membrane with an anode catalyst.

Since the cited references do not disclose directly coating the anode gas diffusion substrate and the ionomer membrane with an anode catalyst, the claims, as pending, are novel.

Therefore, Applicants respectfully urge that the rejection under 35 U.S.C.102(b) should properly be withdrawn.

### **Rejections under 35 U.S.C.103(a)**

The Examiner rejected claim 3 under 35 U.S.C. 103(a) as being unpatentable over Acker in further view of Yamauchi (US 6,878,473). Specifically, the Examiner deemed that it would have been obvious to adjust the catalyst layer thicknesses and optimize them in such a way that the reactants would diffuse through the electrodes and energy generation within the fuel cell is

maximized.

The Examiner rejected claims 4, 5 and 6 as being unpatentable over Acker in view of Jörissen (J. Power Sources 105 (2002) 267 - 273) and Surampudi (US 5,599,638). Specifically, the Examiner asserted that it would have been obvious to modify the catalyst amounts taught by the prior art to optimize the current density.

The Examiner rejected claims 7 and 10 as being unpatentable over Dirven (US 5,561,000) in view of Acker and Starz (US 6,500,217). Specifically, the Examiner asserted that it would have been obvious to apply catalyst to an anode electrode and dry it, apply catalyst to the membrane, and finally hot-pressing each component together to obtain the predictable result of forming a MEA.

The Examiner rejected claims 11 and 12 as being unpatentable over Dirven, Acker and Starz as applied to claim 7 and 10, and further in view of Wilson (US 5,234,777) and Clsar (US 5,635,039). Specifically, the Examiner asserted that it would have been obvious to wash the membrane with water in order to remove impurities from the membrane.

Applicants respectfully submit that the claimed invention provides double-layer anode MEUs with high power density and reduced precious metal loading. See e.g. [0020] of the US publication. The advantages of the claimed invention are striking and unexpected. Specifically, the instant invention allows the anode layer to be made with high layer thickness, high catalyst loading and high porosity. See e.g. [0026] of the US publication. The double layer anode design allows catalyst layers to be thicker by a factor of 2 more than the cathode layer and catalyst loadings which are higher than, by a factor of 2.5, that on the cathode side. See e.g. [0027] of the US publication. These features lead to unexpected results, such as improved power density. See e.g. [0028] of the US publication.<sup>1</sup> The double layer structure of the claimed invention also unexpectedly allows high design flexibility. See e.g. [0025] of the US publication.

Applicants respectfully submit that the cited references, alone or in combination, do not teach or suggest a MEU structure comprising a double layer anode. More importantly, the cited references, alone or in combination, do not teach or suggest a process for manufacturing a MEU

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<sup>1</sup> Although paragraph [0028] relates to a thin cathode layer, one of ordinary skill in the art would recognize that paragraph [0028] likewise refers to thick anode layers.

structure comprising a double layer anode or the unexpected advantages of such a MEU structure having a double layer anode.

Therefore, Applicants respectfully urge that the claims are unobvious and the rejection under 35 U.S.C. 103(a) should properly be withdrawn.

**Request for Interview**

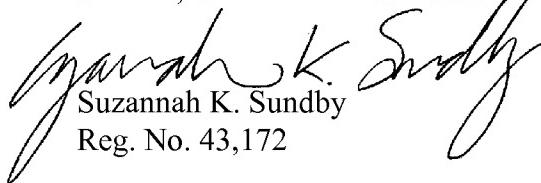
Applicants respectfully request either a telephonic or an in-person interview should there be any remaining issues.

## CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Therefore, it is respectfully requested that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. 1.136(a), and any fees required therefor are hereby authorized to be charged to **Deposit Account No. 02-4300, Attorney Docket No. 034166.006US**.

Respectfully submitted,  
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